

and fruits. He regards chlorophyll and hæmoglobin as antagonistic substances, the one characteristic of the vegetable, the other of the animal kingdom.

To the *Sitzungsberichte* of the Berlin Academy for March 15, Dr. K. von Möbius, the director of the Zoological Museum, communicates a suggestive paper on our perception of the æsthetic proportions of various mammals.

THE April number of the *Journal of Anatomy and Physiology* contains the full text of the paper read by Dr. Albert Gray at the last meeting of the British Association on Helmholtz's theory of hearing. The author proposes a modification of the theory of the German investigator, according to which a remarkable analogy between the senses of hearing and touch is shown to exist.

In the last issue of the *Transactions* of the South African Philosophical Society, Dr. R. Marloth gives the results of his investigations as to the mode of growth of the barnacle infesting the Southern Bight Whale. Were it not for some special provision, the growth of the epidermis beneath, coupled with the wearing away of the outer layer, would soon cause the parasite to be shed, and, as a matter of fact, this actually takes place with the dead shells. The living barnacle cannot, however, be discarded in this manner, since it dissolves the part of the epidermis with which its skin is in contact at the same rate at which fresh epidermal tissue is formed below. Consequently the layer of epidermis between the barnacle and the true skin never varies in thickness, and the parasite accordingly retains its position, the shell disintegrating at the apex at the rate at which it grows at the base.

MM. GAUTHIER VILLARS, Paris, have published the third revised edition of the "Traité élémentaire d'Electricité avec les principales Applications," by M. R. Colson.

MR. FELIX L. DAMES, Berlin, has issued a catalogue of books and papers on astronomy, geodesy, meteorology and related sciences, which he has acquired from the library of the late Dr. H. Romberg, and offers for sale.

THE seventh edition of the late Prof. Milnes Marshall's well-known and practical manual on "The Frog: an Introduction to Anatomy, Histology, and Embryology," edited by Dr. G. Herbert Fowler, has been published by Mr. David Nutt. The chief addition consists of a new series of woodcuts in illustration of the development and metamorphosis of the frog.

THE "Handbook of Jamaica," compiled by Mr. T. L. Roxburgh and Mr. J. C. Ford, and published by Mr. Edward Stanford, is filled with historical, statistical and general information concerning the island. We notice that the magnetic declination, which was 6° 30' E. at the end of last century, and has been steadily decreasing since then, is now only 1° 24' E., and in 1910 its value will be zero.

IN the course of a few weeks, Mr. Gustav Fischer, Jena, will commence the publication of "Aus den Tiefen des Weltmeeres," an elaborate work in which Prof. Carl Chun will describe and illustrate the German deep-sea expedition to Antarctic waters. The work will be published in twelve parts, the first of which will appear during this month and the last in November.

A SIXTH edition, revised and enlarged, of "A Text-book of Assaying," by C. and J. J. Beringer, has just been published by Messrs. Charles Griffin and Co. Mr. J. J. Beringer is responsible for the revision of this handy book for assayers; and he remarks in the preface: "The principal changes in this edition are additions to the articles on gold, cyanides and nickel, and a much enlarged index. The additional matter covers more than forty pages."

NO. 1592, VOL. 62]

SCIENTIFIC students and investigators in Melbourne should be grateful to Mr. T. S. Hall for the "Catalogue of the Scientific and Technical Periodical Literature in the Libraries in Melbourne," which he has prepared. Besides periodicals, the list includes reports of scientific societies, as well as Government reports and Parliamentary papers of scientific import. The catalogue will be a very useful guide to scientific literature accessible in Melbourne and its suburbs.

THE sixteenth part of Mr. Oswin A. J. Lee's fine work, "Among British Birds in their Nesting Haunts, illustrated by the Camera," has just been published by Mr. David Douglas, Edinburgh. The birds illustrated and described are the black-cap, bullfinch, short-eared owl, yellow wagtail, stock dove, pintail, wryneck, and lesser whitethroat. The present part completes the fourth volume, and it is hoped that the whole work will be finished in the course of a few months.

AT the meeting of the Chemical Society on June 1, 1899, Prof. Sydney Young, F.R.S., described a series of tests made by him to determine the relative efficiency of various forms of still-heads for fractional distillation. The design of several new still-heads, superior in many respects to those in common use, was an outcome of the investigation; and chemists will be glad to know that Messrs. J. J. Griffin and Sons have now placed these improved forms upon the market.

THE additions to the Zoological Society's Gardens during the past week include a Mozambique Monkey (*Cercopithecus pygerythrus*, ♀) from Uganda, presented by Lady Ashburnham; two Leopards (*Felis pardus*, ♂ ♀) from India, presented by Mrs. C. Simpson; a Tawny Owl (*Syrnium aluco*) from Scotland, presented by Mrs. C. M. Blackwood; six Common Vipers (*Vipera berus*) from Dorsetshire, presented by Mr. A. Old; nine Natterjack Toads (*Bufo calamita*) from Norfolk, presented by Mr. J. B. Thornhill; a Sykes's Monkey (*Cercopithecus albicularis*, ♀), a Flap-necked Chameleon (*Chamaeleon dilepis*) from East Africa, a Cactus Conure (*Comurus cactorum*) from Bahia, deposited; two Gold Pheasants (*Thaumalea picta*, 2 ♀), two Silver Pheasants (*Euplocamus rynchemerus*, 2 ♀), two Cabot's Horned Tragopans (*Cerionis caboti*, ♂ ♀) from China, two Germain's Peacock Pheasants (*Polyplectron germaini*, ♂ ♀) from Cochin China, two Japanese Pheasants (*Phasianus versicolor*, ♂ ♀), two Scemmerring's Pheasants (*Phasianus soemmeringi*, ♂ ♀) from Japan, three White-backed Trumpeters (*Psophia leucoptera*) from the Upper Amazons, four Wonga-Wonga Pigeons (*Leucosarcia picata*) from New South Wales, a Musky Lorikeet (*Glossopsittacus concinnus*) from Australia, three Blue-crowned Hanging Parrakeets (*Loriculus galgulus*) from Malacca, an Ural Owl (*Syrnium uralense*), North-east European; a Great Wallaroo (*Macropus robustus*, ♂) from South Australia, a Barbary Wild Sheep (*Ovis tragelaphus*, ♂) from North Africa, purchased; a Yak (*Poephagus grunniens*, ♂), born in the Gardens.

#### OUR ASTRONOMICAL COLUMN.

NEW VARIABLE IN TAURUS.—In the *Astronomische Nachrichten* (Bd. 152, No. 3635) M. W. Ceraski, of Moscow, announces the discovery of another new variable by Madame Ceraski during her examination of the plates taken by M. S. Blajko. The star's position is:—

R. A.			Decl.	
h.	m.	s.	+	'
5	33	17.33	...	+26 18 58.3 (1900)
5	30	29.56	...	+26 17 7.9 (1855)

The star is not found in the B.D. At its maximum it is of 9.0-9.5 mag.; at minimum, about 12 mag. or less. On 1900 March 29, it was at the limit of visibility in a telescope of 4.5 inches aperture.

SEARCH EPHEMERIS FOR EROS.—In view of preparing for observations of this minor planet during the coming opposition, the following ephemeris has been prepared by J. B. Westhaver from the elements computed by H. N. Russell (*Astronomical Journal*, No. 479, vol. xx. p. 185).

*Ephemeris for 12h. Greenwich Mean Time.*

1900.	R.A.		Decl.		Mag.
	h.	m. s.	°	' "	
May 3 ...	23	2 0'1	-4	0 25	13'4
5 ...		5 46'7		3 28 2	
7 ...		9 32'3		2 55 29	13'3
9 ...		13 16'9		2 22 45	
11 ...		17 0'5		1 49 52	13'3
13 ...		20 43'1		1 16 48	
15 ...		24 24'9		0 43 35	13'2
17 ...		28 5'8		-0 10 11	
19 ...		31 45'8		+0 23 22	13'2
21 ...		35 25'0		0 57 4	
23 ...		39 3'3		1 30 55	13'1
25 ...		42 40'8		2 4 55	
27 ...		46 17'5		2 39 4	13'1
29 ...		49 53'3		3 13 22	
31 ...	23	53 28'4		+3 47 48	13'0

RELATION BETWEEN SOLAR ACTIVITY AND EARTH'S MOTION.—In the *Astronomische Nachrichten* (Bd. 152, No. 3635), Mr. W. G. Thackeray criticises the recent paper by Dr. J. Halm (*Astr. Nach.* Bd. 151, No. 3619, NATURE, March 8, p. 445), deducing certain relations between the sun-spot cycle, the changes in the obliquity of the ecliptic and the variations of the terrestrial latitude. Mr. Thackeray states first, that continuous observations of sun spots have only been made since 1825, so that the sixty years period lacks sufficient evidence; secondly, that Dr. Halm has ignored some of the systematic errors of observation, particularly those depending on the corrections for temperature in the transit circle reductions, although in some cases their amount affects the value of the obliquity by as great a quantity as the whole amplitude of Chandler's long period inequality of latitude variation. The paper includes a table showing the annual corrections to Leverrier's obliquity from 1836-1896, with corresponding yearly means of Wolf's spot numbers. These differ from the values adopted by Dr. Halm, and the resulting plotted curves show little or no resemblance.

DETERMINATION OF SOLAR PARALLAX FROM OPPOSITION OF EROS.—In the *Astronomical Journal* (No. 480, vol. xx. pp. 189-191), Prof. S. Newcomb directs attention to the favourable opportunity for determining the Solar Parallax which will be afforded by the coming opposition of the minor planet Eros, in December 1900, the conditions being conducive to more accurate direct measurements than have ever before been presented. As another such favourable opportunity will not occur for more than thirty years, several suggestions are made for determining the best combination of observations.

The period during which determinations may be made is remarkably long, as during the five months from 1900 October 15 to 1901 March 15, the distance of the planet will be less than 0.50 astronomical unit.

The high degree of precision attainable in late years by photography indicates this as the best method, an additional point in favour of this plan being that photographic telescopes are already in use at various stations, and need only devoting to this work. In arranging the programme of observations three objects should be kept in view:—

First, the station and hours of exposure should be so chosen as to secure the maximum of parallactic angles.

Secondly, endeavour should be made to secure simultaneous exposures at different stations, in order to lessen the uncertainties arising from differences of scale, changes in relative position of planet among stars, and in the reduction of the position of the planet from hour to hour. Series of independent determinations should also be made, each within an interval of twenty-four hours.

Thirdly, the relative displacement should, as nearly as possible, be in a direction at right angles to the motion of the planet among the stars.

Prof. Newcomb then describes four charts included in the paper, showing projections of the earth as seen from Eros at the Epochs (1) middle of October to end of November; (2) about December 16; (3) about January 10; (4) about February 1. On these are marked the sunset and sunrise lines, and parallels

of latitude corresponding to the principal observatories: Hel-singfors, Pulkowa, 60° lat.; Greenwich, Paris, Potsdam, &c., 50° lat.; Jamaica, Madras, 15° lat.; Arequipa, -15° lat.; Cape of Good Hope, -35° lat. On these projections the direction of the planet's motion for different dates is indicated, so that observers may find by inspection the relative importance of observations at various stations and at various times of night.

Respecting the degree of precision it may be possible to attain in the final result, it is noticeable that the course of the planet throughout the entire period will lie along the borders of the Milky Way, ensuring more and nearer comparison-stars than would otherwise be available. An element of uncertainty is the probable error of measurement from the plates. From a consideration of Kapteyn's investigation of the Hel-singfors parallax plates, and those at Potsdam, it is likely that the probable error of the solar parallax from a pair of simultaneous plates at Arequipa and Hel-singfors would be  $\pm 0''.02$ , and even this might be reduced were it not for the uncertainty arising from the motion of the planet.

#### WORKING SILICA IN THE OXY-GAS BLOWPIPE FLAME.

THE plastic state of silica, and the elasticity of fine threads of vitreous silica, were first observed by M. Gaudin (*Comptes rendus*, viii. 678, 711) in 1839; but his observations seem to have attracted but little attention, and the valuable qualities of "quartz threads" remained unutilised till they were independently rediscovered and applied by Prof. C. V. Boys in 1887.

Similarly, M. A. Gautier succeeded, in 1869, in making very narrow tubes of silica, and showed such tubes in Paris in the year 1878, but he failed to make further progress, even with the aid of M. Moissan's electric furnace (*Comptes rendus*, cxxx. 816, March 26), and his early work was so completely forgotten, both in France and England, that the latest French worker on the subject, M. A. Dufour, was evidently unaware of its existence a few weeks ago (*Comptes rendus*, cxxx. 775, March 19).

But though it thus appears that Prof. Boys was not, as has been supposed, actually the first physicist to draw silica into threads, or work it into fine tubes, there can be no doubt but that his observations, methods of working and experiments have formed the basis of all that has been done since the publication of his first paper in 1887.

In June 1899, one of the authors of this article exhibited (in conjunction with W. T. Evans), at the Royal Society's soirée, a tube of vitreous silica, about 12 cm. in length and 1 cm. in diameter, and at the same time showed the process by which it had been made. Since that date we, the present writers, have made a good deal of further progress. We have succeeded in making longer tubes of various thicknesses, and in joining such tubes both end to end and at right angles. On February 22, we filled and sealed an ungraduated mercury thermometer made entirely of vitreous silica<sup>1</sup>; and what is equally important, we have entirely overcome the difficulty caused by the great tendency of quartz to splinter when suddenly thrust into the oxy-gas flame. We therefore now publish a short account of our methods in the hope that they may enable others to take advantage of the new material without undertaking a tedious preliminary investigation into its properties and the methods of working it. We may perhaps be permitted to add that we have already commenced experiments intended to test the suitability of silica for use in mercury and air thermometers, especially in regard to the fixity, or otherwise of their zero points, that M. A. Dufour is engaged on similar work, especially in relation to high temperature thermometers, and that we are also studying the fitness of silica apparatus for researches on the properties of pure gases.<sup>2</sup>

To prepare Non-splintering Silica.—The best form of silica for use before the blowpipe is rock crystal. This may be obtained in the form of chippings, or in masses which have proved unsuitable for optical work. We have experimented with the lighter particles of Kieselguhr, after well washing them with strong hydrochloric acid, and also with well-washed precipitated silica; but, though these can be worked before the blowpipe without much difficulty, they have not proved satisfactory in our hands, as they yield an opaque product which is only suitable for a few purposes.

<sup>1</sup> NATURE, April 5, p. 540.

<sup>2</sup> This will obviously involve a careful investigation into its power of condensing gases and vapours.